

ABSTRACT OF DISCLOSURE

Disclosed are liquid crystal (LC) phase-retarders and linear polarizers and methods and apparatus for making the same. The liquid crystal phase-retarder is realized by a liquid crystal film structure having one or more phase retardation regions formed therein. Each phase retardation region has an optical axis specified by the direction and depth of orientation of liquid crystal molecules along the surface of the liquid crystal film structure.

The liquid crystal linear polarizer is realized by a liquid crystal film structure having a chiral phase region within which liquid crystal molecules are cholesterically ordered. One or more nematic phase regions are formed along the surface of the liquid crystal film structure within which liquid crystal molecules are oriented along a direction and to a surface depth sufficient to realize one or more phase retardation regions therein having optical axes along the direction of liquid crystal molecule orientation.